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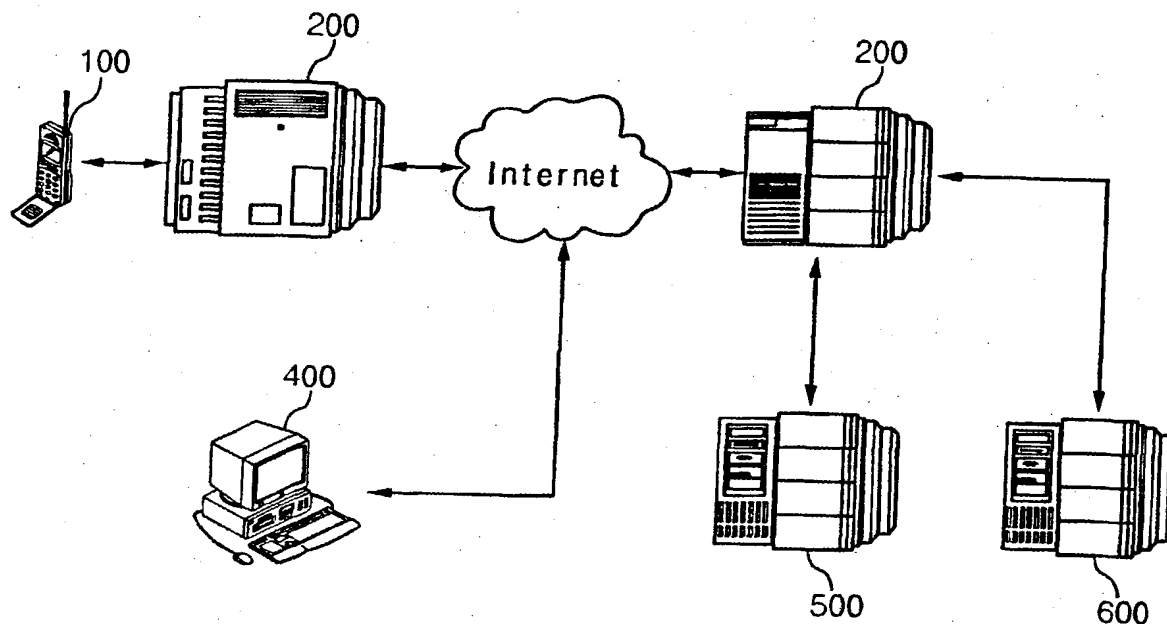
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(54) Title: **GAME PROGRAM DOWNLOADING SYSTEM AND METHOD FOR MOBILE TERMINAL**



(57) Abstract: Disclosed is a system and its method for downloading game programs stored in a game server to a mobile terminal via a wireless network, storing the game programs in a memory and playing the same. The system comprises a web game server for uploading various game programs; a game database for dividing the game programs into program codes and data and storing the same; a mobile terminal for receiving a game list stored in the web game server via the network, selecting a desired game from the game list, downloading corresponding program codes and data, and playing the game using the game program codes and the data; and a wireless network service system for connecting the mobile terminal and the web game server.

Game Program Downloading System and Method for Mobile Terminal

BACKGROUND OF THE INVENTION

(a) Field of the Invention

The present invention relates to a system and method for a mobile terminal user to register desired game programs with the user's mobile terminal, and to modify and upgrade registered contents. More specifically, the present invention relates to a system for receiving game programs by a mobile terminal via a wireless Internet that are stored in a web game server, storing the programs in a memory and reproducing the programs.

(b) Description of the Related Art

Since information communication technology has greatly developed and communication cultures have changed, most youngsters as well as adults have come to carry their own mobile terminals. This wide popularization of mobile communication terminals has made terminal manufacturers make efforts to develop diversified products, and accordingly, recently released terminals have various additional functions as well as the basic voice communication function.

One of the most popular additional functions provided to the mobile terminal is an electronic game program execution function.

Present mobile terminals with a game function have electronic game

programs of predetermined codes in a memory of the terminals. Accordingly, the mobile terminal user performs the electronic game using a key input unit provided on the front of the mobile terminal.

Generally, if a gamer finishes a full course of a game, the gamer will not run the game again. Even though the gamer starts a game previously run by the gamer, he will not be as excited about the game as before.

Since a memory capacity for storing mobile terminal game programs is very limited, various kinds of games cannot be stored in the memory. Particularly, since the capacity of the memory cannot be freely designed, differing from that of an exclusive game device, it is difficult to provide sophisticated game programs to the mobile terminal when regarding trends of minimization and low cost of the mobile terminals.

Therefore, since a plurality of short games with different features or a long story game cannot be provided to the mobile terminal, present electronic games cannot provide continuous excitement to the gamers.

SUMMARY OF THE INVENTION

It is an object of the present invention to provide a game program stored in a game server to a mobile terminal via a wireless network, store the same in a memory and execute it.

It is another object of the present invention to partially provide a

long- story game program to the mobile terminal via a wire or wireless network without having to increase the memory capacity.

It is still another object of the present invention to separately allocate memory regions for storing game programs for respective manufacturers so as to omit repeated developments and processes of game program codes to
5 be installed in the mobile terminals, and hence to reduce product costs.

In one aspect of the present invention, a game program downloading system for a mobile terminal comprises: a web game server for uploading a plurality of game programs to a web site; a game database for
10 dividing the game programs to be provided to the web game server into program codes and data and storing them; a mobile terminal for receiving a list of games provided to the web game server via a network, selecting a desired game from the game list, downloading corresponding program codes and data, and executing the game using the downloaded program codes and
15 data; and a wireless network service system for connecting the mobile terminal with the web game server via the network.

In another aspect of the present invention, in a method for downloading a network game program to a mobile terminal, a game program downloading method for a mobile terminal comprises: automatically reading
20 predetermined number information of the mobile terminal when it is connected to a mobile terminal game program-providing site on a network,

and comparing the information with specifications of products of terminal manufacturers previously established as a database so as to determine whether to download a program; outputting a use prohibition message when downloading of a program is not allowed, and outputting a menu screen of a game category, selecting a desired game to be downloaded, performing a demonstration simulation of the selected game so as to determine whether to perform a download when downloading of a program is allowed; and performing a download and automatic billing when downloading is selected.

BRIEF DESCRIPTION OF THE DRAWINGS

The accompanying drawings, which are incorporated in and constitute a part of the specification, illustrate an embodiment of the invention, and, together with the description, serve to explain the principles of the invention:

FIG. 1 shows a block diagram of a system according to a preferred embodiment of the present invention;

FIG. 2 shows a block diagram of a mobile terminal applied to the system according to a preferred embodiment of the present invention;

FIG. 3 shows data flow between a memory and a CPU when a game is performed at a mobile terminal according to a preferred embodiment of the present invention;

FIG. 4 shows an example of a configuration of a game menu displayed on a mobile terminal or a computer screen when downloading a game program via the system according to a preferred embodiment of the present invention;

5 FIG. 5 shows an example of a simulation screen for displaying operations of a game menu when downloading a game program via the system according to a preferred embodiment of the present invention;

FIG. 6 shows a flowchart of downloading of a game program by the system according to a preferred embodiment of the present invention; and

10 FIG. 7 shows a flowchart of executing a game program at a mobile terminal according to a preferred embodiment of the present invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

15 In the following detailed description, only the preferred embodiment of the invention has been shown and described, simply by way of illustration of the best mode contemplated by the inventor(s) of carrying out the invention. As will be realized, the invention is capable of modification in various obvious respects, all without departing from the invention. Accordingly, the drawings and description are to be regarded as illustrative in
20 nature, and not restrictive.

FIG. 1 shows a block diagram of a system according to the preferred

embodiment of the present invention. As shown, a web game server 300 for managing Internet sites having game program downloading menus is connected to a game database 500 for categorizing a plurality of game programs as object codes and data, and storing them.

5 A member database 600 for storing and managing members' personal information is connected to the web game server 300.

 A mobile terminal 100 is connected to a web mobile terminal game download site by the web game server via a wireless Internet service system 200.

10 When the mobile terminal 100 is connected to the web mobile terminal game download site via the Internet and a request for downloading a mobile terminal game is generated, the web game server 300 provides the object codes and the data of the game program of the menu selected by the mobile terminal user to the corresponding mobile terminal 100 via the
15 wireless Internet service system 200. In this instance, the object codes can be separated from or linked to the data.

 A user personal computer (PC) 400 can be connected to the web mobile terminal game download site.

 Differing from the program codes affixed to a predetermined memory
20 within a conventional terminal, the user accesses the Internet game server via the wireless Internet using a mobile terminal, selects desired game

program codes and the data to be combined with the game program codes from various electronic game programs provided to the corresponding web game server 300, and receives the same in a linked or separated manner.

Particularly, the user respectively receives the data of different stages or steps on an identical program (object codes) and performs the game at a desired stage or step.

For this, the web game server 300 for the user to access using a mobile terminal is needed, and a memory 120 (illustrated in FIG. 2) for storing desired downloaded game programs is to be provided in the mobile terminal 100.

The user receives various game programs and data by receiving information on the manufacturers and product categories of the mobile terminals that are connected via the Internet from a network service provider that manages the wireless Internet service system 200.

The web game server 300 comprises a memory, that is, the game database 500 for storing the object codes and the data according to classifications of CPUs for respective manufacturers and products of the mobile terminals in divided regions, and receives addresses for storing game codes and data of the memory of the mobile terminal from the mobile terminal, automatically converts the object codes and the data according to the corresponding addresses to be linked, and performs a download.

The web game server 300 has a simulation function for game lists and demonstrations so that users who access the server may conveniently select and receive desired electronic games and corresponding various data stored in the game database.

5 FIG. 2 shows a block diagram of the mobile terminal 100.

As shown, the mobile terminal comprises a memory 120 for dividing the game program transmitted by the web game server into program codes and data and storing or removing them; a display 130 for displaying the mobile terminal states and game screen outputs; an interface 140 for
10 interfacing data with a device such as a computer; a key input unit 150; a voice signal processor 160; a radio frequency (RF) signal processor 170; and a central processing unit (CPU) 110 for controlling the above-noted components and executing a menu program for performing a corresponding game program.

15 The above-described mobile terminal can access the wireless Internet, and the memory transmits and receives various event signals to/from the CPU so as to perform and finish the game program.

The mobile terminal 100 receives wireless Internet services via a network service provider that manages the wireless Internet service system
20 200, and is connected to the web game server 300 via the wireless Internet.

The user PC 400 is connected to the web game server 300 via a

conventional Internet service network.

When the mobile terminal 100 is connected to the web game server 300 via the wireless Internet, a user watches a game list, like that shown in FIG. 4, displayed on the display 130 of the mobile terminal 100 and receives
5 game program data of separated or combined game program codes and data.

Differing from this, when a user uses the PC 400 to access the web game server 300, the user watches a game list, selects a desired game or data, and inputs a mobile terminal number to which the game will be
10 downloaded to the web game server, and hence the game is downloaded.

A mobile terminal game program downloaded to the PC 400 is downloaded to the mobile terminal by connecting the interface 140 of the mobile terminal 100 with a serial/parallel data input/output port using an additional cable.

15 FIG. 4 shows an example of a list for selecting games and data supported by the web game server 300. When a user watches the game list displayed on the display of the mobile terminal 100 or the monitor screen of the PC 400 and selects an icon of a desired game, a simulation of the game for a quick review is displayed.

20 FIG. 3 shows a data process of a game program execution of the mobile terminal 100. That is, FIG. 3 shows data communication between the

memory 120 for storing the game program data and the CPU 110 within the mobile terminal when a user receives program codes and data using an Internet browser function, stores them in the memory 120 and executes the game.

5 In this instance, the program codes downloaded from the web game server 300 are stored in a code information region 121, and the downloaded data are stored in a data information region 122.

Hence, when the user selects a predetermined menu to execute the downloaded program codes, the CPU 110 of the mobile terminal is switched
10 to a game mode from a mobile terminal mode, and the program stored in the code information region 121 of the memory 120 is started.

When the program of the code information region 121 is started, the CPU 110 reads data necessary for program execution from the data information region 122, sets a starting point and a scenario of the game
15 program, periodically transmits timer events to the code information region 121, and each time the user generates a key input via the key input unit 150, the CPU 110 detects the key input, generates a key button event and transmits the key button event to the code information region 212.

When the mobile terminal user executes the game downloaded to
20 the mobile terminal, the timer event enables the CPU 110 to periodically call the game region and to execute a predetermined game without being

effected by a normal standby mode of the mobile terminal.

The code information region 121 of the memory 120 executes the game program via the data information region 122 and screen information region 123.

5 When the user selects a game ending or a call generation is detected while the program in the code information region is executed, the CPU 110 of the mobile terminal transmits a stop event or a pause event to the code information region 121 to invoke a game-stopping process.

10 As described above, when the stop event or the pause event is transmitted to the code information region 121 from the CPU 110, present states or data are transmitted to the data information region 122 and then stored.

15 The code information region 121 transmits screen information of the mobile terminal controlled by the program execution by the CPU to the screen information region 123 to be stored, and the CPU periodically reads the screen information and outputs it to the display 130.

To give effects to the user when executing or terminating the program in the code information region 121, effect events for creating sounds are provided to the CPU 110.

20 FIG. 6 shows a flowchart of an operation of the web game server for receiving a game program for a mobile terminal via the Internet.

As shown, when a mobile terminal accesses a mobile terminal game program downloading site managed by a web game server, the server reads specific number information of the mobile terminal, and compares it with specifications for respective manufacturers previously input to a database so as to determine whether to allow program downloading.

When the terminal that has accessed the web site does not support game program downloading, states of a PC access mode are determined. When the state is not the PC access mode, a use prohibition message is output, and when it is the PC access mode, a menu screen of game categories is output, a game to be downloaded is selected, and a demonstration simulation of the selected game program is performed to determine whether to receive the game program via a download.

In this instance, when downloading is desired, a cell phone number is requested and the game is downloaded. The request for the cell phone number is used to authenticate and bill the user. In the case of a free service, this request can be omitted. In the case of a membership service, a member ID can be requested as a substitute for or in addition to the cell phone number. After downloading, the program codes and the data are combined, and a corresponding game program transmission via the Internet is completed.

After this, the game program provided to the PC is loaded to the cell

phone via a communication interface cable so that the user performs a new game via the mobile terminal.

When it is determined that the mobile terminal supports game program downloading, a menu screen of game categories is output, a game to be downloaded is selected, and a demonstration simulation of the selected game program is performed to determine whether to receive the game program via a download.

In the case of the mobile terminal receiving the game program via a direct download, the web game server receives an address from the mobile terminal for storing object language program codes and data according to categories of the CPUs for the respective manufacturers and products of the mobile terminals, and automatically converts the object language codes and the data according to the corresponding address and then downloads.

When performing the download, the web game server can automatically bill the user.

As described above, the user can receive desired games when necessary, and in the case a single game has plural stages the user only receives game data codes of a desired stage that is within the available capacity of the memory, since the corresponding program execution codes are identical, and performs the game.

Therefore, the user can continuously execute a long story game

program using the mobile communication terminal.

FIG. 7 shows a flowchart of an execution of a game program downloaded via a mobile terminal according to the present invention.

As shown, when a user manipulates a mobile terminal to switch a
5 previous mode into the game mode, the CPU reads the program codes and the data codes stored in a memory and instructs to execute a corresponding game. In this instance, the CPU performs a start event and a timer event to control the game from the standby mode of the mobile terminal.

The game is executed according to key button event values, and
10 when a user desires or a call signal is detected, a pause event or a stop event is created, processing information up to then is stored in the memory, and the game mode is switched to a mobile phone telephoning mode or a mobile phone standby mode.

As described above, since a user downloads game programs stored
15 in the web game server to the mobile terminal via the wireless Internet, stores them in the memory and plays the same, the problem of limited installation of game programs because of lack of memory capacity of the mobile terminal is solved.

Also, the user can enjoy a full story game on line or off line by
20 partially downloading the same to the mobile terminal without adding additional memory to the mobile terminal.

In addition, since the present invention can omit duplicated developments and installation processes of the mobile terminal game program codes by only assigning memory regions for storing the game programs of the respective manufacturers, the production cost is reduced.

5 While this invention has been described in connection with what is presently considered to be the most practical and preferred embodiment, it is to be understood that the invention is not limited to the disclosed embodiments, but, on the contrary, is intended to cover various modifications and equivalent arrangements included within the spirit and scope of the
10 appended claims.

WHAT IS CLAIMED IS:

1. A game program downloading system for a mobile terminal comprising:

a web game server for uploading a plurality of game programs to a web site;

a game database for dividing the game programs to be provided to the web game server into program codes and data and storing them;

a mobile terminal for receiving a list of games provided to the web game server via a network, selecting a desired game from the game list, downloading corresponding program codes and data, and executing the game using the downloaded program codes and data; and

a wireless network service system for connecting the mobile terminal with the web game server via the network.

2. The system of claim 1, wherein the web game server comprises a member database for storing and managing members' personal information for membership system management.

3. The system of claim 1, wherein the game database stores object codes and data according to classifications of central processing units (CPU) for respective manufacturers and products of the mobile terminals in divided regions, receives addresses for storing game codes and data of a memory of the mobile terminal from the mobile terminal, automatically

converts the object codes and the data according to the corresponding addresses to be linked, and performs a download.

4. The system of claim 1, wherein the mobile terminal comprises:

a memory for dividing the game program transmitted by the web
5 game server into program codes and data and storing or removing them;
a display for displaying mobile terminal states and game screen
outputs;

an interface for interfacing data with a device such as a computer;

a key input unit;

10 a voice signal processor;

a radio frequency (RF) signal processor; and

a CPU for controlling the above-noted components and executing a
menu program for performing a corresponding game program.

5. The system of claim 4, wherein the memory transmits and
15 receives timer events that are generated for each predetermined period, start
events and key button events generated by a manipulation of the key input
unit, pause events or stop events generated when a signal is input or a user
stops a running game, effect events for generating sound, and screen
information to/from the CPU.

20 6. A game program downloading system for mobile terminals
comprising:

a web game server for uploading a plurality of game programs to a web site;

a game database for dividing the game programs to be provided to the web game server into program codes and data and storing them;

5 a personal computer (PC) for receiving a list of games provided to the web game server via a network, selecting a desired game from the game list, and downloading corresponding program codes and data; and

a mobile terminal for downloading the game program codes and data downloaded to the PC, via a communication interface cable, and
10 executing the corresponding game program.

7. The system of claim 6, wherein when the PC requests a game program download, the web game server requests a mobile terminal number for user authentication and billing, and downloads the selected game program.

15 8. In a method for downloading a network game program to a mobile terminal, a game program downloading method for a mobile terminal comprising:

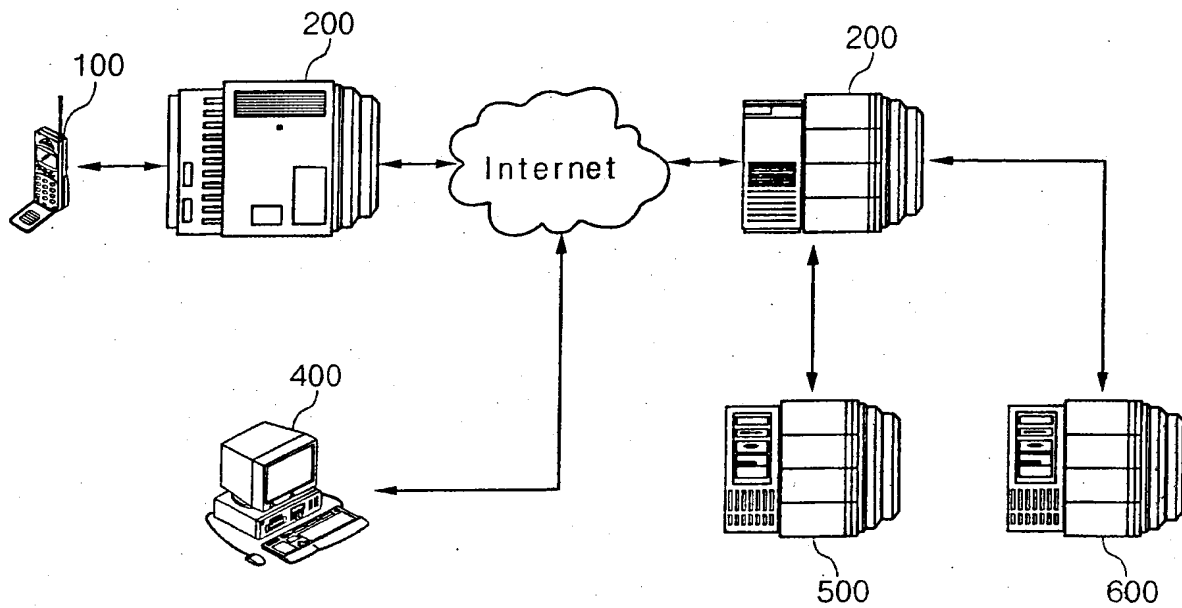
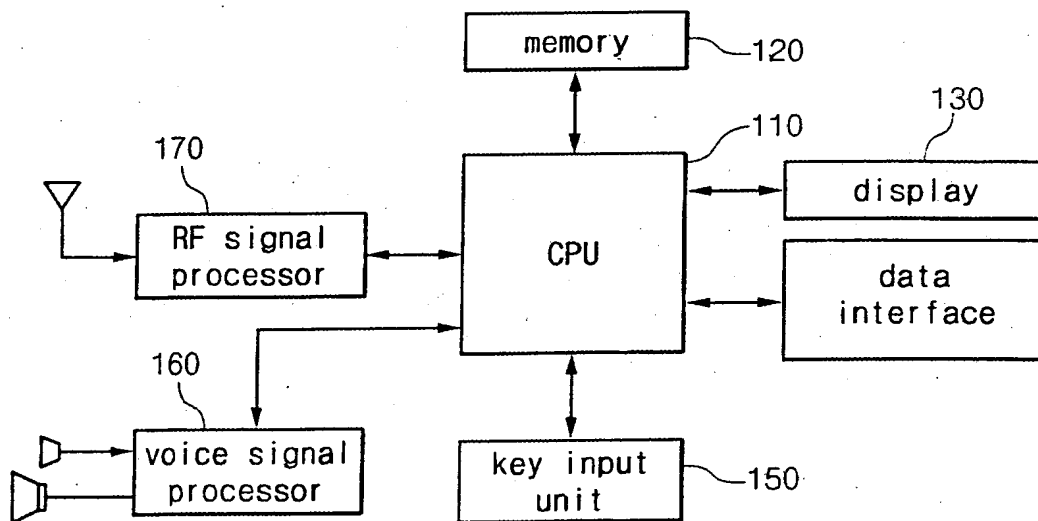
automatically reading predetermined number information of the mobile terminal when it is connected to a mobile terminal game program-providing site on a network, and comparing the information with
20 specifications of products of terminal manufacturers previously established

as a database so as to determine whether to download a program;

outputting a use prohibition message when downloading of a
program is not allowed, and outputting a menu screen of a game category,
selecting a desired game to be downloaded, performing a demonstration
5 simulation of the selected game so as to determine whether to perform a
download when downloading of a program is allowed; and

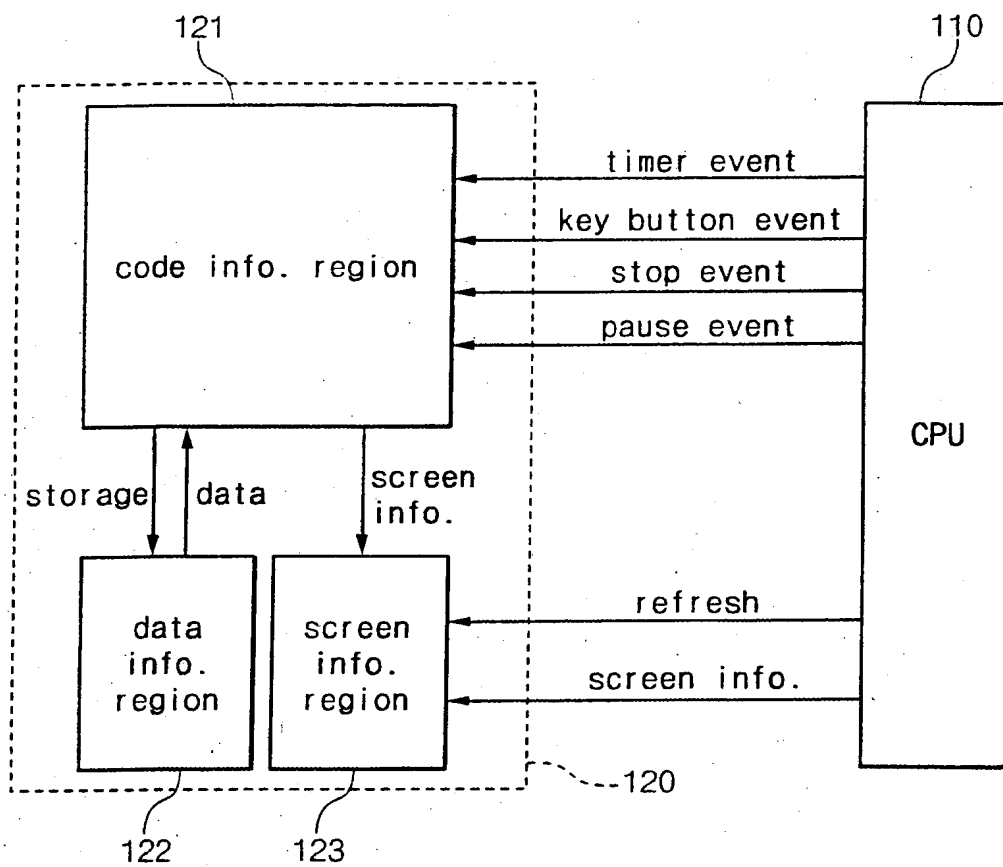
performing a download and automatic billing when downloading is
selected.

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Fig. 1**Fig. 2**

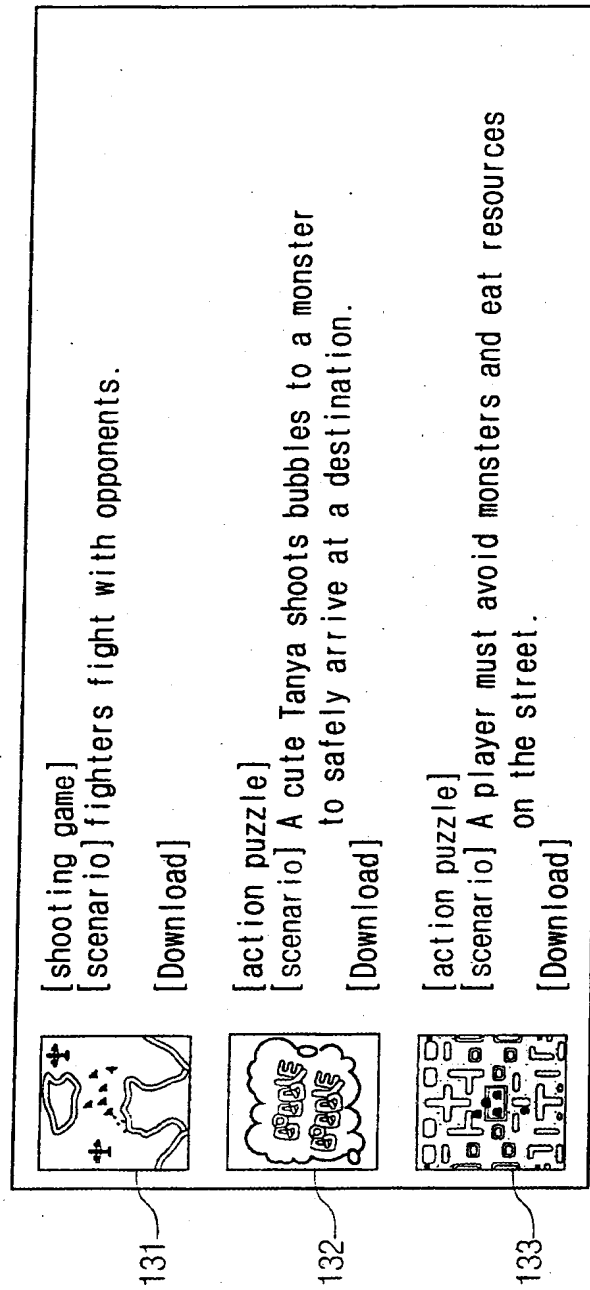
2/6

Fig. 3



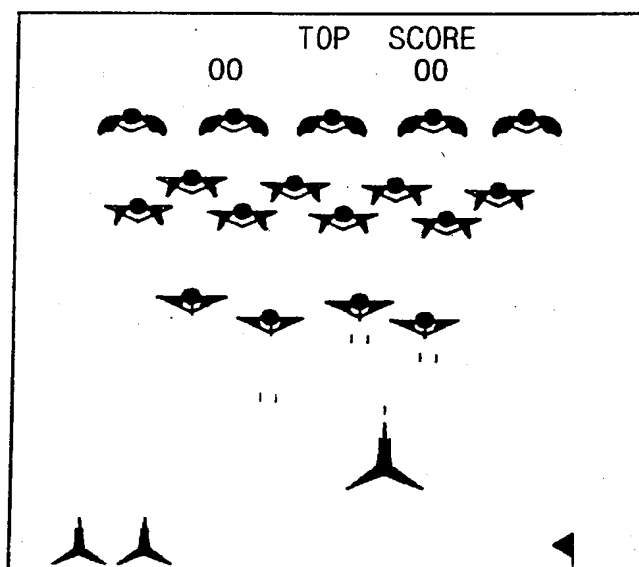
3/6

Fig. 4



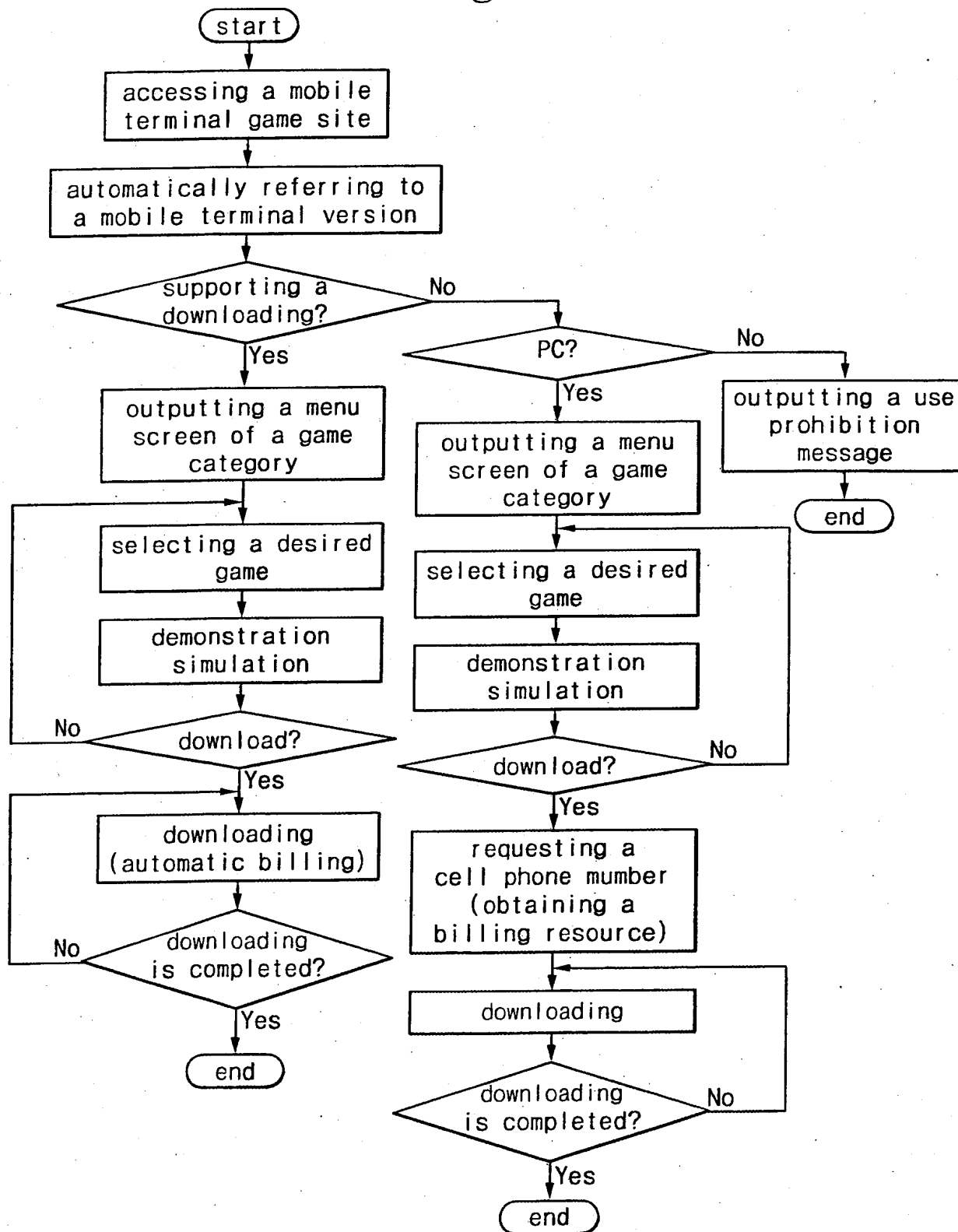
4/6

Fig. 5



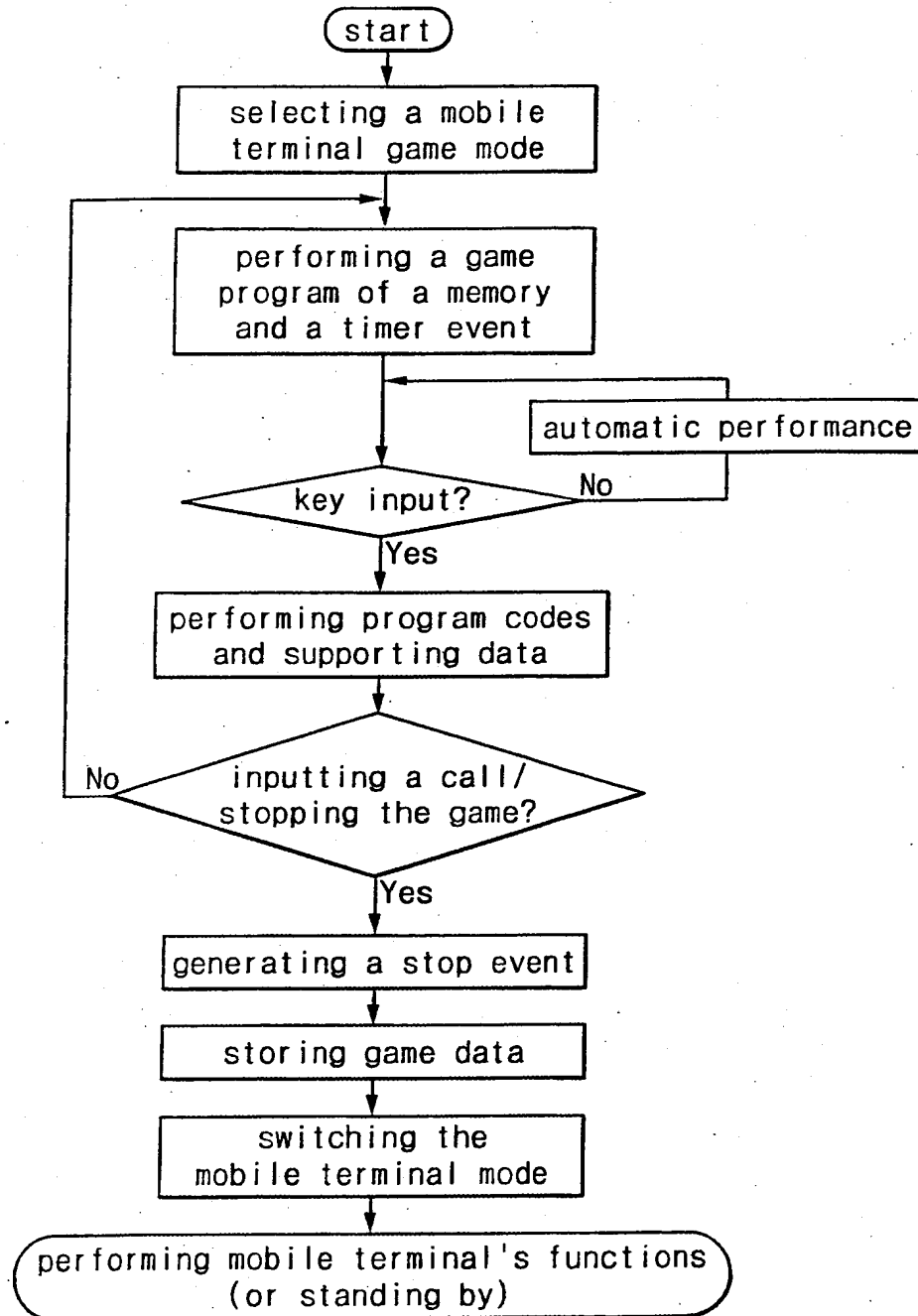
5/6

Fig. 6



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Fig. 7



INTERNATIONAL SEARCH REPORT

International application No.
PCT/KR01/00413

A. CLASSIFICATION OF SUBJECT MATTER

IPC7 H04Q 7/24, H04Q 7/38

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

H04Q 7/24, 7/38, H04L 12/46

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

KR, JP : IPC as above

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
NPS(wireless, mobile, software, program, download, transmit, internet)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X Y	US 6031830 A (TELXON CORPORATION) 29 FEBRUARY 2000, see abstract. Claims NO.1-7	1-2, 4-6 3, 7-8
P, A	US 6044062 A (COMMUNIQUE LLC.) 28 MARCH 2000, see abstract	1-2, 4-6
P, A	US 6058422 A (LUCENT TECHNOLOGIES INC.) 2 MAY 2000, see whole document	1-8

☐ Further documents are listed in the continuation of Box C.

☐ See patent family annex.

* Special categories of cited documents:
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